National Grid

Paige Graening
Counsel

August 19, 2004

Mary L. Cottrell, Secretary
Department of Telecommunications and Energy
One South Station, 2nd Floor
Boston, MA 02110

RE: MDTE 03-128:Record Responses by New England Power Company

Dear Secretary Cottrell:

Enclosed are one(1) original and six (6) copies of all Record Requests posed to New England Power Company during the evidentiary hearings in MDTE 03-128:

DTE RR -1, DTE RR-2, DTE RR-3 and DTE RR-4

USGenNE RR-1, USGenNE RR-2, USGenNE RR-3, USGenNE RR-4, USGenNE RR-5, USGenNE RR-6, USGenNE RR-7 and USGenNE RR-8

Salem RR-1, Salem RR-2 and Salem RR-3

If there should arise any questions with regard to this filing, please let me know.

Respectfully submitted,

Paige Graening

PG/sag

Enclosures

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Cc: Mary Beth Gentleman, Esq.
James Toomey, Esq.
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DTE Record Request 1

Request:

Please provide, from the NEPOOL OP-12 document issued prior to version dated October 2003, the estimated capability or assumed capability for Units 1 through 3 of Salem Harbor Station.

Response:

Attached are the October 2003 version of NEPOOL OP-12 (Attachment A) and the July 22, 1998 version (Attachment B). Please note that the 1998 version does not include the unit-specific reactive capabilities.

Prepared by or under the supervision of John W. Martin, P.E.

NEPOOL Operating Procedure No. 12

VOLTAGE AND REACTIVE CONTROL

Approved: October 3, 2003 by the NEPOOL Participants Committee

References:

1. ISO New England Transmission Operating Guides - All Voltage/Reactive Guides
2. NEPOOL Operating Procedure No. 4 - Action During a Capacity Deficiency (OP 4)
3. NEPOOL Operating Procedure No. 7 - Action in an Emergency (OP 7)
4. NEPOOL Operating Procedure No. 14 - Technical Requirements for Generation, Dispatchable and Interruptible Load (OP 14)
5. NEPOOL Operating Procedure No. 16 - Transmission System Data (OP 16)
6. NEPOOL Operating Procedure No.19 - Transmission Operations (OP 19)
7. Master/Satellite Procedure No. 9 - Operation of the Chester Static VAR Compensator (M/S 9)
8. NERC Planning Standard III.C.S2.M3 and III.C.S2.M4

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APPENDIX

I. INTRODUCTION

This procedure provides broad criteria, operating practices and responsibilities to help ensure that desired/reliable voltage and reactive conditions are maintained on the power system. It also includes general actions to control voltage/reactive conditions when deviations from normal occur or are needed to minimize adverse effects during abnormal conditions.

More specific criteria and actions may be required when the measures described in this procedure do not correct the abnormal voltage/reactive conditions. This information is contained in detailed voltage/reactive documents issued as part of the ISO New England Transmission Operating Guides. Whereas these guides are referenced several times throughout this procedure, Appendix A lists the documents and indicates the types of information they contain. To facilitate references to Appendix A, its column numbering and headings are consistent with the format and order of this procedure.

II. CRITERIA

a. VOLTAGE SCHEDULES AND LIMITS FOR GENERATORS AND KEY TRANSMISSION STATIONS

Major generating stations throughout New England have specified voltage schedules, which should be maintained as closely as possible in system operations. They should also be used by operators and planners in off-line studies of the power system. During certain conditions at a generating station or on the power system, sustained deviations from voltage schedules may be required/unavoidable and minimum and maximum voltages have been established that can be sustained at generating stations during these infrequent conditions.

In addition to voltage schedules, minimum and maximum voltage limits at several key generating or transmission stations have been established to promote system reliability during adverse voltage/reactive conditions. These reliability concerns can be based on the security of the transmission system or station service supplies to nuclear generators. The key stations and associated voltage limits are detailed in the area Voltage Guides issued as part of the ISO New England Transmission Operating Guides (refer to Appendix A, column 1).

b. GENERATOR REACTIVE CAPABILITIES, COMMITMENTS AND REQUIRED REACTIVE RESERVES

Generator reactive capabilities available to regulate voltages should be employed in system operations and analyses. Data collection methods (see OP 14) have been designed such that these reactive capabilities should be fully available except for occasional times when unique temporary problems occur at a particular generating station.

To promote security of the transmission system during adverse voltage/reactive conditions, required unit commitments and levels of required reactive reserve for generators within certain areas of New England and for the Chester SVC have been established. System conditions that warrant the prescribed unit commitments or reactive reserves have also been identified. Details are provided in the ISO New England Transmission Operating Guides (see Appendix A columns 2 and 3).

III. VOLTAGE/REACTIVE OPERATING PRACTICES

a. TRADITIONAL VOLTAGE/REACTIVE CONTROL

Besides the use of generator reactive capabilities, the proper dispatch of shunt capacitors/reactors combined with effective transformer voltage schedules or fixed tap settings are the most traditional means of achieving desired voltages and reactive conditions. Listings of switchable shunt devices installed to support the New England transmission system (115 kV and above) and guides for switching them can be found in the area Voltage Guides (see Appendix A, column 4).

b. TRANSMISSION INTERFACE TRANSFER LIMITS TO AVOID LOW VOLTAGE

In some cases, custom software tools have been developed to calculate voltage based transfer limits for transmission interfaces. These limits ensure acceptable voltage response to contingencies. Appendix A column 5 notes the transmission operating guides that contain voltage based transfer limits for transmission interfaces.

c. CIRCUIT SWITCHING TO CONTROL HIGH VOLTAGE

In some areas, transmission circuit switching is a viable option for controlling high voltage/excessive charging conditions. Appendix A column 6 identifies the ISO New England Transmission Operating Guides that provide information for switching circuits in the Boston area to control high voltage.

d. LOAD MANAGEMENT FOR VOLTAGE/REACTIVE RELIABILITY

In severe cases of low voltage and/or inadequate reactive reserves, load management actions can be taken. Details on conditions when these actions can/should be used and how they should be implemented are provided in the Voltage Guides (as identified in Appendix A, column 7) and NEPOOL Operating Procedures No. 4 and 7.

IV. RESPONSIBILITIES

This procedure is based on the principle that voltage control is best achieved when action is taken as close as possible to the affected area. Voltage schedules and other reactive conditions will be supervised by Station, Satellite and the ISO operators, each being responsible for an ever expanding area of responsibility. Regardless of who's requesting or directing corrective measures, action must ultimately be taken by Station or Satellite operators depending on who has "hands on" control of the reactive resources.

a. GENERATING AND TRANSMISSION STATIONS

Generating and transmission station operators are responsible for maintaining station service and other local voltage requirements and scheduled voltages at levels designated by individual Participants. Generating stations are also responsible for maintaining voltage schedules set for the high side of the generator step-up transformers by the appropriate NEPOOL committee. Normally, automatic voltage regulation works off the low side of the step-up transformer (generator terminals). Thus, in order to maintain a high side voltage schedule, manual intervention can be required to offset varying power flows through and voltage drops across the step-up transformer.

When unable to maintain scheduled station and local voltages with the means under their control, the generating or transmission station operators must notify their respective Satellite operator (and local dispatch authority if appropriate).

b. SATELLITES

Satellites are responsible for monitoring and supervising the following conditions within their territories:

- voltage schedules and limits,

- unit MVAR loadings, capabilities and reserves,
- shunt capacitor and reactor dispatches,
- transformer voltage schedules or fixed tap settings,
- synchronous condenser operation (requested via ISO New England by the Satellite unless in emergency conditions),
- MVAR flows between the AC system and HVDC facilities,
- Static VAR Compensator operation (must be coordinated with the ISO),
- line switching for voltage/reactive control (must be coordinated with the ISO and, if warranted, with other Satellites),
- the Satellites will notify/ coordinate the need for MW re-dispatch for MVAR requirements with the ISO. The Satellites will not directly re-dispatch MW with generators unless it is an emergency,
- other predefined indicators of voltage/reactive security (e.g. a particular circuit flow, the status of specific units, area load level, etc.).

Satellites are responsible for: 1) detecting and correcting deviations from normal scheduled voltage/reactive operations, 2) responding to notifications by generating or transmission station operators of difficulty in maintaining station or other local voltage or reactive schedules and, 3) responding to ISO requests to assist with inter-Satellite or inter-Area problems.

Satellites are authorized to exercise the following actions to correct voltage/reactive difficulties within their territories:

- direct voltage schedules and levels of reactive output and reserve on generators, synchronous condensers and Static VAR Compensators,
- direct the use of shunt capacitors and reactors,
- direct the operation of LTC transformers.

When a Satellite is unable to correct a voltage/reactive problem using the above actions or the Satellite believes that the problem should be handled on a multi-Satellite or inter-Area basis, the Satellite will notify the ISO and request assistance.

Before exercising any of the following voltage/reactive control actions, Satellites must notify the ISO and coordinate their implementations:

- line switching,
- load management.

c. ISO NEW ENGLAND

The ISO is responsible for the general monitoring and supervision of voltage/reactive conditions on the New England bulk power system (115 KV and above). If in monitoring the system a problem is detected within a Satellite, the ISO will contact the Satellite and request action.

When a Satellite reports to the ISO that it is not possible to correct a problem at a station or Satellite level, the ISO will assume direct responsibility for alleviating the problem. The ISO is authorized to direct, through the appropriate Satellite(s), all actions listed in the above Satellite section B and in addition any MW re-dispatching.

The ISO is also responsible for monitoring and supervising voltage/reactive operations of inter-Area ties. Problems may be noticed by the ISO or appear in the form of requests from neighboring pools or companies for assistance. The ISO will inform the appropriate Satellite(s) of the nature of the problem specifying; the pool or company involved, the location of the undesirable voltage/reactive condition and, general conditions aggravating the difficulty. The ISO is authorized to work with/through the Satellites and use all section B actions and MWh re-dispatching to eliminate the problem.

When abnormal voltage/reactive operating conditions materialize, the ISO may initiate a survey of key system parameters to better assess the nature and expanse of the conditions. Appendix B contains the survey forms that the ISO will use. The forms are broken down based on Satellite territories.

Document History

OP 12.rtf	08/18/1998
Updated Appendix A, B	05/27/2003

Voltage/Reactive Documents in the ISO New England Transmission Operating Guides

Voltage/Reactive Document	1 Voltage Limits	2 Units Critical To Voltage Control	3 Req'd. Reactive Reserves	4 Shunt Information	5 Interf. Voltage Xfer Lims.	6 Line Switching For High Voltage	7 Load Management Actions
Eastern REMVEC Low Voltage Guide	✓		✓	✓			✓
Northern New England Transmission Corridor-Low Voltage Guide	✓	✓		✓			✓
Northern New England Transmission Corridor - High Voltage Guide	✓	✓		✓			
Orrington Capacitors	✓			✓			
Boston Area Planning and Operations Guide	✓			✓		✓	✓
Northwest Vermont Interchange Procedure		✓			✓		
Sandy Pond Reactive Switching	✓						
M/S-9 Operation of the Chester SVC	✓	✓	✓	✓			
M/S 1 Nuclear Plant Operation	✓						
ME V/R Guide and Calculator	✓				✓		
SWCT V/R Guide and Calculator	✓				✓		
CT V/R Guide and Calculator	✓				✓		

Appendix B-1
Generators

REMVEC

Voltage & Reactive Schedules and Surveys

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey Date: / Time: / Load period: Heavy/Light		
	Heavy Load Period (1)			Light Load Period (2)							
	Schedule	Maximum	Minimum	Schedule	Maximum	Minimum	Lagging	Leading	Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
AES GRANITE RIDGE CT 1	238	241	219	225	241	219	161	-75			
AES GRANITE RIDGE CT 1	238	241	219	225	241	219	161	-75			
ANP BELLINGHAM 1	356	362	335	350	362	335	95	-100			
ANP BELLINGHAM 2	356	362	335	350	362	335	95	-100			
ANP BLACKSTONE 1	356	362	335	350	362	335	95	-100			
ANP BLACKSTONE 2	356	362	335	350	362	335	95	-100			
BEAR SWAMP 1	240	241	219	225	241	219	150	-75			
BEAR SWAMP 2	240	241	219	225	241	219	150	-75			
BRAYTON 1	118	121	110	116	121	110	126	-42			
BRAYTON 2	118	121	110	116	121	110	126	-42			
BRAYTON 3	358	362	335	352	362	335	290	-230			
BRAYTON 4	358	362	328	352	362	328	250	-150			
CANAL 1	358	362	335	355	362	335	250	-50			
CANAL 2	358	362	335	355	362	335	190	-50			
CLEARY CC	118	121	110	116	121	110	88	-54.5			
COMERFORD	240	241	219	225	241	219	78	-48.8			
DARMOUTH POWER	115	121	109	115	121	109	39.2	-12.5			
DIGHTON POWER 1	118	121	110	116	121	110	30	0			

NOTE: Units not listed will follow local voltage schedules in accordance with Satellite requirements or Interconnection Agreements.
(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays

(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table/ curve.

REMVEC	**Appendix B-2**
Voltage & Reactive Schedules and Surveys	**Generators**

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey		
									Date:		
									Time:		
									Load period:	Heavy/Light	
	Heavy Load Period (1)			Light Load Period (2)							
	Schedule	Maximum	Minimum	Schedule	Maximum	Minimum	Lagging	Leading	Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
FORE RIVER GT 1	118	121	110	116	121	110	256	-90			
FORE RIVER GT 2	118	121	110	116	121	110	256	-90			
FORE RIVER ST 1	118	121	110	116	121	110	200	-120			
FPL RISE GT 1	119	121	110	117	121	110	110	-90			
FPL RISE GT2	119	121	110	117	121	110	110	-90			
FPL RISE ST 1	119	121	110	117	121	110	110	-90			
KENDALL REPOW G1	119	121	110	117	121	110	N/a	N/a			
KENDAL REPOW G2	119	121	110	117	121	110	N/a	N/a			
KENDAL REPOW G3	119	121	110	117	121	110	N/a	N/a			
KENDAL REPOW G4	119	121	110	117	121	110	N/a	N/a			
MANCHESTER ST 9 /9A	119	121	110	117	121	110	105	-96			
MANCHESTER ST 10/10A	119	121	110	117	121	110	105	-96			
MANCHESTER ST 11/11A	119	121	110	117	121	110	105	-96			
MEDWAY J1	238	241	219	235	241	219	20	-10			
MEDWAY J2	238	241	219	235	241	219	20	-10			
MEDWAY J3	115	121	109	115	121	109	20	-20			
MILFORD POWER (1-2)	117	121	110	115	121	110	80	-57			
MILLENIUM GT	117	121	112	115	121	110	125	-90			
MILLENIUM ST	117	121	112	115	121	110	62	-44			
MOORE (1-4)	240	241	219	225	241	219	64	-40			
MYSTIC 4	119	121	109	117	121	109	104	-75			

NOTE: Units not listed will follow local voltage schedules in accordance with Satellite requirements or Interconnection Agreements.
(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays
(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table NA: Not available

REMVEC **Appendix B-3**

Voltage & Reactive Schedules and Surveys **Generators**

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey		
									Date:		
									Time:		
									Load period:	Heavy/Light	
	Heavy Load Period (1)			Light Load Period (2)							
	Schedule	Maximum	Minimum	Schedule	Maximum	Minimum	Lagging	Leading	Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
MYSTIC 5	119	121	109	117	121	109	104	-75			
MYSTIC 6	119	121	109	117	121	109	104	-75			
MYSTIC 7	360	362	335	352	362	335	316	-150			
MYSTIC 8	360	362	335	352	362	335	N/a	N/a			
MYSTIC 9	360	362	335	352	362	335	N/a	N/a			
NEA BELLINGHAM (1-3)	358	362	328	352	362	328	75	-45			
NEW BOSTON 1	119	121	109	117	121	109	220	-46			
OCEAN STATE 1 (1-3)	356	362	335	350	362	335	213	-90			
OCEAN STATE 2 (4-6)	356	362	335	350	362	335	213	-90			
PILGRIM	358	362	342	355	362	342	335	-100			
POTTER 2	117	126	115	117	126	115	53	-22			
SALEM HARBOR 1	119	121	109	117	121	109	28	-36			
SALEM HARBOR 2	119	121	109	117	121	109	37.5	-12.5			
SALEM HARBOR 3	119	121	109	117	121	109	67	-45			
SALEM HARBOR 4	119	121	109	117	121	109	275	-165			
SEMASS G1	116	121	109	116	121	109	15	-5			
SEMASS G2	116	121	109	116	121	109	10	-2			
SOMERSET 6	116	121	110	115	121	110	86	0			
TIVERTON (GT, ST)	115	121	109	115	121	109	180	-50			

VERMONT YANKEE	360	362	342	354	362	342	150	-100			

NOTE: Units not listed will follow local voltage schedules in accordance with Satellite requirements or Interconnection Agreements.

(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays
(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table /curve . N/A : Not available

REMVEC

Appendix B-4

Voltage & Reactive Schedules and Surveys for Autotransformers with LTCs

Generators

		Tap-Changer Control						Survey	
								Date:	
								Time:	
								Load period:	Heavy/Light
				Available LTC Taps		Voltage Control Bandwidth			
Substation	High Side kV/ Low Side kV	LTC Operation (Automatic/Manual)	Scheduled Voltage	Max	Min	High Limit (kV)	Low Limit (kV)	Actual Voltage (kV)	LTC Operation (Automatic/Manual)
COOLIDGE XF	345/115	A	117	33	1	138	92		
GRANITE XF	230/115	A	116	16	-16	138	92		
KINGSTON XF									

Appendix B-5
REMVEC Transmission Capacitors & Reactors

Voltage & Reactive Schedules and Surveys for Transmission Capacitors & Reactors

Transmission Capacitor Information		Survey	-
		Date:	
		Time:	
		Load period:	Heavy/Light
Location	Available MVAR	Actual Voltage (kV)	Closed/ Open
HYANNIS-GE2	1 @ 40		
KENT COUNTY	1 @ 63		
MANCHESTER ST.	1 @ 63		
K-STREET-1	1 @ 53.6		
K-STREET-2	1 @ 53.6		
MYSTIC	1 @ 53.6		
LEXINGTON	1 @ 53.6		
BAKER STREET #1	1 @ 53.6		
BAKER STREET #2	1 @ 53.6		
NEEDHAM	1 @ 53.6		
FRAMINGHAM	1 @ 53.6		
HIGHGATE	6 @ 20 2 @ 10		
COOLIDGE	2 @ 25		
Location	Available MVAR	Actual Voltage (kV)	Closed/ Open
SANDBAR	1 @ 24.8		
ESSEX #1	1 @ 24.8		
ESSEX #2	1 @ 24.8		
ESSEX #3	1 @ 24.8		
ESSEX #4	1 @ 24.8		
WILLISTON	1 @ 24.8		
MIDDLEBURY	1 @ 22.9		
NORTH RUTLAND	1 @ 24.8		
BERLIN	1 @ 24.8		
GEORGIA	1 @ 24.8		
MILLBURRY	1 @ 63		
NORTHBORO RD.	1 @ 54		
PRATTS JCT.	1 @ 63		
TEWKSBURY #1	1 @ 63		

TEWKSBURY #2	1 @ 63		

Transmission Reactor Information		Survey	_
		Date:	
		Time:	
		Load period:	Heavy/Light
Location	Available MVAR	Actual Voltage (kV)	Closed/ Open
K-STREET	1@ - 80		
WOBURN REACT	3 @ -80		
MYSTIC	1 @ -80		
NORTH CAMBRIDGE	2 @ -80		

Appendix B-6
Generators

CONVEX

Voltage & Reactive Schedules and Surveys

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey		
									Date:		
									Time:		
									Load period:	Heavy/Light	
	Heavy Load Period (1)			Light Load Period (2)							
	Schedule	Maximum	Minimum	Schedule	Maximum	Minimum	Lagging	Leading	Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
AES THAMES	117	121	110	117	121	110	80	0			
ALTRESCO	119	121	109	119	121	109	105	-44			
BERKSHIRE POWER	117	121	108	117	121	105	163	-50			
BRIDGEPORT ENERGY	118	121	116	117	121	116	260	-50			
BRIDGEPORT HBR 2	118	121	116	117	121	116	115	0			
BRIDGEPORT HBR 3	118	121	116	117	121	116	260	-160			
BRIDGEPORT RESCO	118	121	116	117	121	116	30	-36			
CROSS SOUND CABLE	357	362	340	357	362	340	N/a	N/a			
DEVON 7	118	121	116	117	121	116	47	-19			
DEVON 8	118	121	116	117	121	116	47	-19			
LAKE ROAD 1	357	362	340	357	362	340	174	-90			
LAKE ROAD 2	357	362	340	357	362	340	174	-90			
LAKE ROAD 3	357	362	340	357	362	340	174	-90			
MASS POWER	119	121	111	119	121	111	135	-81			
MIDDLETOWN 2	118	121	112	116	121	112	54	-20			
MIDDLETOWN 3	118	121	112	116	121	112	87	-37			
MIDDLETOWN 4	357	362	340	357	362	340	200	-90			

(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays

(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table /curve.

Appendix B-7
Generators

CONVEX

Voltage & Reactive Schedules and Surveys

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey		
									Date:		
									Time:		
									Load period:	Heavy/Light	
	Heavy Load Period (1)			Light Load Period (2)							
	Schedule	Maximum	Minimum	Schedule	Maximum	Minimum	Lagging	Leading	Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
MILFORD 1	118	121	116	117	121	116	150	-40			
MILFORD 2	118	121	116	117	121	116	150	-40			
MILLSTONE 2	357	362	345	357	362	345	420	0			
MILLSTONE 3	357	362	345	357	362	345	565	0			
MONTVILLE 5	117	121	110	117	121	110	86	-35			
MONTVILLE 6	117	121	110	117	121	110	200	-60			
MOUNT TOM	117	121	111	117	121	109	55	0			
NEW HAVEN HBR	119	121	116	117	121	116	143.5	0			
NORTHFIELD G1	359	362	344	351	362	344	80	-40			
NORTHFIELD G2	359	362	344	351	362	344	80	-40			
NORTHFIELD G3	359	362	344	351	362	344	80	-40			
NORTHFIELD G4	359	362	344	351	362	344	80	-40			
NORTHFIELD P1	359	362	344	351	362	344	80	-45			
NORTHFIELD P2	359	362	344	351	362	344	80	-45			
NORTHFIELD P3	359	362	344	351	362	344	80	-45			
NORTHFIELD P4	359	362	344	351	362	344	80	-45			
NORWALK HBR 1	119	121	114	119	121	113	62	-40			

(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays
(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table/ curve.

Appendix B-8
Generators

CONVEX

Voltage & Reactive Schedules and Surveys

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey		
									Date:		
									Time:		
									Load period:	Heavy/Light	
	Heavy Load Period (1)			Light Load Period (2)							
	Schedule	Maximum	Minimum	Schedule	Maximum	Minimum	Lagging	Leading	Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
NORWALK HBR 2	119	121	114	119	121	113	54	-36			
ROCKY RIVER	117	121	105	116	121	105	15	0			
SHEPAUG	117	121	109	116	121	109	8	-8			
SOUTH MEADOW 5	116	121	106	116	121	105	30	-20			
SOUTH MEADOW 6	116	121	106	116	121	105	30	-20			
STEVENSON 1	117	121	112	117	121	112	3.75	0			
STEVENSON 2	117	121	112	117	121	112	3.75	0			
STEVENSON 3	117	121	112	117	121	112	3.75	0			
STEVENSON 4	117	121	112	117	121	112	3.75	0			
STONY BROOK	359	362	335	351	362	335	150	-40			
WALLINGFORD ENERGY (1-5)	117	121	108	117	121	105	125	-125			
WEST SPRINGFIELD 1	117	121	108	117	121	105	35	-23			
WEST SPRINGFIELD 2	117	121	108	117	121	105	74	-52			
WEST SPRINGFIELD 3	117	121	108	117	121	105	40	-34			

(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays
(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table/ curve.

Appendix B-9
Autotransformers w/LTCs

CONVEX Voltage & Reactive Schedules and Surveys for Autotransformers with LTCs

		Tap-Changer Control						Survey	
								Date:	
								Time:	
								Load period:	Heavy/Light
				Available LTC Taps		Voltage Control Bandwidth			
Substation	High Side kV/ Low Side kV	LTC Operation (Automatic/Manual)	Scheduled Voltage	Max	Min	High Limit (kV)	Low Limit (kV)	Actual Voltage (kV)	LTC Operation (Automatic/Manual)
BERKSHIRE	345/115	A	119			120	118		
CARD	345/115	A	115			116	114		
EAST SHORE	345/115	M	119			n/a	n/a		
FROST BRIDGE	345/115	A	118			119	117		
LUDLOW	345/115	A	119			120	118		
MANCHESTER	345/115	A	116			117	115		
MONTVILLE	345/115	A	117			118	116		
NORTH BLOOMFIELD	345/115	A	116			117	115		
PLUMTREE	345/115	A	116			117	115		

SOUTHINGTON BUS #1	345/115	A	118			119	117		
SOUTHINGTON BUS #2	345/115	A	118			119	117		

Appendix B-10
CONVEX Transmission Capacitors & Reactors

Voltage & Reactive Schedules and Surveys for Transmission Capacitors & Reactors

Transmission Capacitor Information		Survey	_
		Date:	
		Time:	
		Load period:	Heavy/Light
Location	Available MVAR	Actual Voltage (kV)	Closed/ Open
AGAWAM 11K	50.4		
AGAWAM 12K	50.4		
BERLIN #1	37.8		
BERLIN #2	37.8		
BERLIN #3	50.4		
CANTON #1	25.2		
CANTON #2	26.2		
DARIEN	37.8		
EAST SHORE #1	42.0		
EAST SHORE #2	42.0		
FRANKLIN DRIVE	37.8		
FROST BRIDGE #1	50.4		
FROST BRIDGE #2	50.4		
FROST BRIDGE #3	50.4		
GLENBROOK #1	36.0		
GLENBROOK #2	36.0		
GLENBROOK #3	36.0		

GLENBROOK #4	36.0		
Location	Available MVAR	Actual Voltage (kV)	Closed/ Open
GLENBROOK #5	37.8		
MANCHESTER #1	50.4		
MANCHESTER #2	50.4		
MANCHESTER #3	50.4		
MANCHESTER #4	50.4		
MANCHESTER #5	50.4		
MANCHESTER #6	50.4		
MONTVILLE #1	50.4		
MONTVILLE #2	50.4		
MYSTIC #1	25.2		
MYSTIC #2	25.2		
NORTH BLOOMFIELD #1	50.4		
NORTH BLOOMFIELD #2	50.4		
NORTH BLOOMFIELD #3	50.4		
NORTH HAVEN	42.0		
NORWALK #1	37.8		
NORWALK #2	37.8		
PLUMTREE #1	50.4		
PLUMTREE #2	37.8		
ROCKY RIVER	25.2		
SACKETT	42.0		
SOUTHINGTON #1	50.4		
SOUTHINGTON #2	50.4		
SOUTHINGTON #3	50.4		
STONY HILL	25.2		

WATERSIDE	37.8		

Appendix B-11
Generators

MAINE

Voltage & Reactive Schedules and Surveys

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey		
									Date:		
									Time:		
									Load period:	Heavy/Light	
	Heavy Load Period (1)			Light Load Period (2)					Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
	scheduled	minimum	Maximum	Scheduled	Minimum	Maximum	Lagging	Leading			
ANDROSCOGGIN E C #1	120	113	121	120	113	121	16	15			
ANDROSCOGGIN E C #2	120	113	121	120	113	121	16	15			
ANDROSCOGGIN E C #3	120	113	121	120	113	121	16	15			
BUCKSPORT G4	120	113	121	120	113	121	115	75			
HARRIS HYDRO G1	120	113	121	120	113	121	12	0			
HARRIS HYDRO G2	120	113	121	120	113	121	12	0			
HARRIS HYDRO G3	120	113	121	120	113	121	12	0			
M. INDEPENDENCE GT1	121	114	123	121	114	123	110	65			
M. INDEPENDENCE GT2	121	114	123	121	114	123	110	65			
M. INDEPENDENCE ST	121	114	123	121	114	123	118	80			
RUMFORD POWER GT	120	113	121	120	113	121	110	25			
RUMFORD POWER ST	120	113	121	120	113	121	59	25			
WESTBROOK 1	120	113	121	120	113	121	110	36			
WESTBROOK 2	120	113	121	120	113	121	110	36			
WESTBROOK 3	120	113	121	120	113	121	127	87			
YARMOUTH 1	120	113	121	120	113	121	14	0			
YARMOUTH 2	120	113	121	120	113	121	14	0			
YARMOUTH 3	120	113	121	120	113	121	55	0			
YARMOUTH 4	355	349	362	355	349	362	242	209			

(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays

(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table /curve.

Appendix B-12
Generators

MAINE

Voltage & Reactive Schedules and Surveys

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey Date: Time: Load period: Heavy/Light		
	Heavy Load Period (1)			Light Load Period (2)					Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
	scheduled	minimum	Maximum	Scheduled	Minimum	Maximum	Lagging	Leading			
WYMAN HYDRO 1	120	113	121	120	113	121	12	0			
WYMAN HYDRO 2	120	113	121	120	113	121	12	0			
WYMAN HYDRO 3	120	113	121	120	113	121	12	0			

(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays
(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table / curve.

Appendix B-13
Autotransformers w/LTCs

MAINE Voltage & Reactive Schedules and Surveys for Autotransformers with LTCs

		Tap-Changer Control						Survey	
								Date:	
								Time:	
								Load period:	Heavy/Light
				Available LTC Taps		Voltage Control Bandwidth			
Substation	High Side kV/ Low Side kV	LTC Operation (Automatic/Manual)	Scheduled Voltage	Max	Min	Low Limit (kV)	High Limit (kV)	Actual Voltage (kV)	LTC Operation (Automatic/Manual)
SOUTH GORHAM T1	345/115	A-note 1	119	16	-16	118	120		
SUROWIEC T1	345/115	A	119	16	-16	118	120		
MASON T9	345/115	A	119	16	-16	118	120		
MAXCY'S T3	345/115	A	119	16	-16	118	120		
ORRINGTON T1	345/115	A-note 2	121-note 3	16	-16	120	122		
ORRINGTON T2	345/115	A-note 2	121-note 3	16	-16	120	122		

note 1- This transformer LTC run in manual when WEC is online.

note 2- These transformer LTC's run in manual when MIS is online.

note 3- When being operated in manual the Orrington scheduled voltage is ~1kV less than Graham bus voltage.

APPENDIX B-14
MAINE Transmission Capacitors & Reactors

Voltage & Reactive Schedules and Surveys for Transmission Capacitors & Reactors

Transmission Capacitor Information			Survey	_
			Date:	
			Time:	
			Load period:	Heavy/Light
Location		Available MVAR	Actual Voltage (kV)	Closed/ Open
CHESTER SVC CAP	345 kV	1 @ 442		
ORRINGTON KC1	115kV	1 @ 67		
ORRINGTON KC2	115kV	1 @ 67		
ORRINGTON KC3	115kV	1 @ 67		
MAXCY'S KC1	115kV	1 @ 50		
MAXCY'S KC2	115kV	1 @ 50		
MASON KC2	115kV	1 @ 50		
MASON KC3	115kV	1 @ 50		
SUROWIEC KC1	115kV	1 @ 50		
SUROWIEC KC2	115kV	1 @ 50		
SUROWIEC KC3	115kV	1 @ 50		
SOUTH GORHAM KC1	115kV	1 @ 50		
SOUTH GORHAM KC2	115kV	1 @ 50		
SANFORD 115 KC1	115kV	1@30.6		

Transmission Reactor Information			Survey	_
			Date:	
			Time:	
			Load period:	Heavy/Light
Location		Available MVAR	Actual Voltage (kV)	Closed/ Open
CHESTER SVC REACTIVE	345 kV	1@ - 125		
ORRINGTON KR1	115kV	1@ - 40		
ORRINGTON KR2	115kV	1 @ -40		
SUROWIEC KR1	115 kV	1 @ -40		
SUROWIEC KR2	115 kV	1 @ -40		

Appendix B-15
Generators

PSNH

Voltage & Reactive Schedules and Surveys

Units	Voltage Schedule						MVAr Capability @ SCC (3)		Survey		
									Date:		
									Time:		
									Load period:	Heavy/Light	
	Heavy Load Period (1)			Light Load Period (2)							
	scheduled	minimum	Maximum	Scheduled	Minimum	Maximum	Lagging	Leading	Actual Voltage (kV)	MVARs	AVR Status (ON/OFF)
AES GRANITE RIDGE ST 1	119	109	121	119	109	121	161	-75			
MERRIMACK 1	119	109	121	119	109	121	45	-30			
MERRIMACK 2	119	109	121	119	109	121	165	-100			
NEWINGTON	357	339	362	357	339	362	137	-70			
CONED NEWINGTON ENERGY 1	357	339	362	357	339	362	105	0			
CONED NEWINGTON ENERGY 2	357	339	362	357	339	362	105	0			
CONED NEWINGTON ENERGY 3	357	339	362	357	339	362	120	0			
SCHILLER 4	119	109	121	119	109	121	30	-12.5			
SCHILLER 5	119	109	121	119	109	121	30	-12.5			
SCHILLER 6	119	109	121	119	109	121	30	-12.5			
SEABROOK	357	345	362	357	345	362	580	-120			

(1) Heavy 07:00-22:00 hours Monday Through Saturday except Holidays
(2) Light all others
(3) Data from NX-12D, pt. 13 (MVar lagging), pt. 18 (MVar leading) of the Normal Reactive Capability portion of the table /curve.

Appendix B-16
PSNH Transmission Shunt Capacitors & Shunt Reactors

Voltage & Reactive Schedules and Surveys for Transmission Shunt Capacitors & Shunt Reactors

Transmission Capacitor Information		Survey	_
		Date:	
		Time:	
		Load period:	Heavy/Light
Location	Available MVAR	Actual Voltage (kV)	Closed/ Open
BEEBE	20		
OCEAN RD. #1	25.2		
OCEAN RD. #2	25.2		
CHESTNUT HILL #1	12.6		
CHESTNUT HILL #2	12.6		
CHESTNUT HILL #3	25.2		
MERRIMACK #1	36.1		
MERRIMACK #2	36.1		

Transmission Reactor Information		Survey	_
		Date:	
		Time:	
		Load period:	Heavy/Light
Location	Available MVAR	Actual Voltage (kV)	Closed/ Open
Scobie Pond #1	40.0		
Scobie Pond #2	40.0		

Appendix B-17
PSNH Autotransformers w/LTCs

Voltage & Reactive Schedules and Surveys for Autotransformers with LTCs

		Tap-Changer Control						Survey		
								Date:		
								Time:	Heavy/Light	
				Available LTC Taps		Voltage Control Bandwidth		Load period:	Heavy/Light	
Substation	High Side kV/ Low Side kV	LTC Operation (Automatic/Manual)	Scheduled Voltage	Max	Min	High Limit (kV)	Low Limit (kV)	Actual Voltage (kV)	LTC Tap	LTC Operation (Automatic/Manual)
DEERFIELD TB14	345/115	A	119.6	33	1	120.8	118.5			
SCOBIE TB30	345/115	A	119.6	33	1	120.8	118.5			

NEPOOL Operating Procedure No. 12

VOLTAGE AND REACTIVE CONTROL

Approved: July 22, 1998 by the NEPOOL Regional Market Operations Committee and the NEPOOL Regional Transmission Operations Committee to be implemented for the Second Effective Date for Market Implementation.

References:

1. ISO New England Transmission Operating Guides - All Voltage/Reactive Guides
2. NEPOOL Operating Procedure No. 4 - Action During a Capacity Deficiency (OP 4)
3. NEPOOL Operating Procedure No. 7 - Action in an Emergency (OP 7)
4. NEPOOL Operating Procedure No. 14 - Technical Requirements for Generation and Load (OP 14)
5. NEPOOL Operating Procedure No. 16 - Transmission System Data (OP 16)
6. NEPOOL Operating Procedure No.19 - Transmission Operations (OP 19)
7. Master/Satellite Procedure No. 9 - Operation of the Chester Static VAR Compensator (M/S 9)

TABLE OF CONTENTS

I. INTRODUCTION

This procedure provides broad criteria, operating practices and responsibilities to help ensure that desired/reliable voltage and reactive conditions are maintained on the power system. It also includes general actions to control voltage/reactive conditions when deviations from normal occur or are needed to minimize adverse effects during abnormal conditions.

More specific criteria and actions may be required when the measures described in this procedure do not correct the abnormal voltage/reactive conditions. This information is contained in detailed voltage/reactive documents issued as part of the ISO New England Transmission Operating Guides. Whereas these guides are referenced several times throughout this procedure, Appendix A lists the documents and indicates the types of information they contain. To facilitate references to Appendix A, its column numbering and headings are consistent with the format and order of this procedure.

II. CRITERIA

A. Voltage Schedules and Limits for Generators and Key Transmission Stations

Major generating stations throughout New England have specified voltage schedules, which should be maintained as closely as possible in system operations. They should also be used by operators and planners in off-line studies of the power system. During certain conditions at a generating station or on the power system, sustained deviations from voltage schedules may be required/unavoidable and minimum and maximum voltages have been established that can be sustained at generating stations during these infrequent conditions.

In addition to voltage schedules, minimum and maximum voltage limits at several key generating or transmission stations have been established to promote system reliability during adverse voltage/reactive conditions. These reliability concerns can be based on the security of the transmission system or station service supplies to nuclear generators. The key stations and associated voltage limits are detailed in the area Voltage Guides issued as part of the ISO New England Transmission Operating Guides (refer to Appendix A, column 1).

B. Generator Reactive Capabilities, Commitments and Required Reactive Reserves

Generator reactive capabilities available to regulate voltages should be employed in system operations and analyses. Data collection methods (see OP 14) have been designed such that these reactive capabilities should be fully available except for occasional times when unique temporary problems occur at a particular generating station.

To promote security of the transmission system during adverse voltage/reactive conditions, required unit commitments and levels of required reactive reserve for generators within certain areas of New England and for the Chester SVC have been established. System conditions that warrant the prescribed unit commitments or reactive reserves have also been identified. Details are provided in the ISO New England Transmission Operating Guides (see Appendix A columns 2 and 3).

III. VOLTAGE/REACTIVE OPERATING PRACTICES

A. TRADITIONAL VOLTAGE/REACTIVE CONTROL

Besides the use of generator reactive capabilities, the proper dispatch of shunt capacitors/reactors combined with effective transformer voltage schedules or fixed tap settings are the most traditional means of achieving desired voltages and reactive conditions. Listings of switchable shunt devices installed to support the New England transmission system (115 kV and above) and guides for switching them can be found in the area Voltage Guides (see Appendix A, column 4).

B. CIRCUIT SWITCHING TO CONTROL HIGH VOLTAGE

In some areas, transmission circuit switching is a viable option for controlling high voltage/excessive charging conditions. Appendix A column 5 identifies the ISO New England Transmission Operating Guides that provide information for switching circuits in the Boston area to control high voltage.

C. LOAD MANAGEMENT FOR VOLTAGE/REACTIVE RELIABILITY

In severe cases of low voltage and/or inadequate reactive reserves, load management actions can be taken. Details on conditions when these actions can/should be used and how they should be implemented are provided in the Voltage Guides (as identified in Appendix A, column 6) and NEPOOL Operating Procedures No. 4 and 7.

IV. RESPONSIBILITIES

This procedure is based on the principle that voltage control is best achieved when action is taken as close as possible to the affected area. Voltage schedules and other reactive conditions will be supervised by Station, Satellite and the ISO operators, each being responsible for an ever expanding area of responsibility. Regardless of who's requesting or directing corrective measures, action must ultimately be taken by Station or Satellite operators depending on who has "hands on" control of the reactive resources.

A. GENERATING AND TRANSMISSION STATIONS

Generating and transmission station operators are responsible for maintaining station service and other local voltage requirements and scheduled voltages at levels designated by individual Participants. Generating stations are also responsible for maintaining voltage schedules set for the high side of the generator step-up transformers by the appropriate NEPOOL committee. Normally, automatic voltage regulation works off the low side of the step-up transformer (generator terminals). Thus, in order to maintain a high side voltage schedule, manual intervention can be required to offset varying power flows through and voltage drops across the step-up transformer.

When unable to maintain scheduled station and local voltages with the means under their control, the generating or transmission station operators should notify their respective Satellite operator (and local dispatch authority if appropriate).

B. SATELLITES

Satellites are responsible for monitoring and supervising the following conditions within their territories:

- voltage schedules and limits,
- unit MVAR loadings, capabilities and reserves,
- shunt capacitor and reactor dispatches,
- transformer voltage schedules or fixed tap settings,
- synchronous condenser operation,
- MVAR flows between the AC system and HVDC facilities,
- Static VAR Compensator operation (must be coordinated with the ISO),
- line switching for voltage/reactive control (must be coordinated with the ISO and, if warranted, with other Satellites),
- the Satellites will notify/ coordinate the need for MW re-dispatch for MVAR requirements with the ISO. The Satellites will not directly re-dispatch MW with generators unless it is an emergency,
- other predefined indicators of voltage/reactive security (e.g. a particular circuit flow, the status of specific units, area load level, etc.).

Satellites are responsible for: 1) detecting and correcting deviations from normal scheduled voltage/reactive operations, 2) responding to notifications by generating or transmission station operators of difficulty in maintaining station or other local voltage or reactive schedules and, 3) responding to ISO requests to assist with inter-Satellite or inter-Area problems.

Satellites are authorized to exercise the following actions to correct voltage/reactive difficulties within their territories:

- direct voltage schedules and levels of reactive output and reserve on generators, synchronous condensers and Static VAR Compensators,
- direct the use of shunt capacitors and reactors,
- direct the operation of LTC transformers.

When a Satellite is unable to correct a voltage/reactive problem using the above actions or the Satellite believes that the problem should be handled on a multi-Satellite or inter-Area basis, the Satellite will notify the ISO and request assistance.

Before exercising any of the following voltage/reactive control actions, Satellites must notify the ISO and coordinate their implementations:

- line switching,
- load management.

C. ISO NEW ENGLAND

The ISO is responsible for the general monitoring and supervision of voltage/reactive conditions on the New England bulk power system (115 KV and above). If in monitoring the system a problem is detected within a Satellite, the ISO will contact the Satellite and request action.

When a Satellite reports to the ISO that it is not possible to correct a problem at a station or Satellite level, the ISO will assume direct responsibility for alleviating the problem. The ISO is authorized to direct, through the appropriate Satellite(s), all actions listed in the above Satellite section B and in addition any MW re-dispatching.

The ISO is also responsible for monitoring and supervising voltage/reactive operations of inter-Area ties. Problems may be noticed by the ISO or appear in the form of requests from neighboring pools or companies for assistance. The ISO will inform the appropriate Satellite(s) of the nature of the problem specifying; the pool or company involved, the location of the undesirable voltage/reactive condition and, general conditions aggravating the difficulty. The ISO is authorized to work with/through the Satellites and use all section B actions and MWh re-dispatching to eliminate the problem.

When abnormal voltage/reactive operating conditions materialize, the ISO may initiate a survey of key system parameters to better assess the nature and expanse of the conditions. Appendix B contains the survey forms that the ISO will use. The forms are broken down based on Satellite territories.

Document History

OP 12.rtf
8/18/98

Voltage/Reactive Documents in the ISO New England Transmission Operating Guides

Voltage/Reactive Document	1 Voltage Limits	2 Req'd Unit Commitments	3 Req'd. Reactive Reserves	4 Shunt Information	5 Line Switching For High Voltage	6 Load Management Actions
Eastern REMVEC Low Voltage Guide	✓		✓	✓		✓
Low Voltage Guidelines-Connecticut 345 KV System	✓		✓	✓		✓
Northern New England Transmission Corridor-Low Voltage Guide	✓			✓		✓
Northern New England Transmission Corridor - High Voltage Guide	✓	✓		✓		
Orrington Capacitors	✓			✓		
Southern Connecticut Voltage Guidelines	✓			✓		
Connecticut Forecasting and Operating Guideline		✓				
Must Run Units/Conditions in the Boston Area		✓				
Method to Ensure Reliable "All Lines In" Voltage/Reactive Operation in VT		✓		✓		
Operation of the Boston Edison Tertiary Reactors				✓		
Boston Area Voltage Control - Light Load					✓	
Switching Guidelines for Line 372 (Voltage Control)					✓	
Operations Guide for 349 Cable Switching					✓	
M/S-9 Operation of the Chester SVC	✓		✓			

Voltage and Reactive Survey

REMVEC

UNITS	VOLT SCHED HVY/LGT	VOLT ACTUAL	MVARS	STATIONS/LINES TRANSFORMERS	VOLT SCHED	VOLT ACTUAL	MVARS	CAPACITORS/ REACTORS	AVAIL	MVARS
BRAYTON 1	118/116			COOLIDGE XF				BAKER ST	107	
BRAYTON 2	118/116			GRANITE XF				FRAMINGHAM	54	
BRAYTON 3	358/352			KINGSTON XF				LEXINGTON	54	
BRAYTON 4	358/352							K ST	107	
CANAL 1	358/355							MYSTIC	54	
CANAL 2	358/355							NEEDHAM	54	
MYSTIC 4	119/117							WOBURN REACT	-80	
MYSTIC 5	119/117							N. CAMBRIDGE REACT	-102	
MYSTIC 6	119/117							MYSTIC REACT	-80	
MYSTIC 7	360/352							MILLBURY	63	
NEA BELLINGHAM	358/352							PRATTS	63	
NEW BOSTON 1	119/117							KENT COUNTY	63	
NEW BOSTON 2	119/117							TEWKSBURY	126	
SALEM HARBOR 3	119/117							FRANKLIN SQ	63	
SALEM HARBOR 4	119/117							ESSEX	50	
OCEAN STATE 1	355/350							SANDBAR	25	
OCEAN STATE 2	355/350							WILLISTON	25	
SOMERSET 6	116/115							MIDDLEBURY	23	
BEAR SWAMP 1	234/230							N. RUTLAND	24	
BEAR SWAMP 2	234/230							BERLIN	24	
PILGRIM	358/358							EAST FAIRFAX	24	
CLEARY CC	118/116							HYANNIS	40	
MILFORD POWER	115/115							COMERFORD 451		
MOORE	240/225							COMERFORD 452		
COMERFORD	240/225							SANDY PD 3512		
VERMONT YANKEE	360/354							SANDY PD 3521		

Notes: Transformers: (+) denotes flow into low side (-) denotes flow into high side

CONVEX

UNITS	VOLT SCHED HVY/LGT	VOLT ACTUAL	MVARS	STATIONS/LINES TRANSFORMERS	VOLT SCHED	VOLT ACTUAL	MVARS	CAPACITORS/ REACTORS	AVAIL	MVARS
BRIDGEPORT HBR 2	118/117			BERKSHIRE 345				EAST SHORE	84	
BRIDGEPORT HBR 3	118/117			BERKSHIRE 115				SACKETT	42	
DEVON 7	118/117			BERKSHIRE XF				NORTH HAVEN	42	
DEVON 8	118/117			ALPS-BERK 393				MANCHESTER	314	
MIDDLETOWN 2	118/116			FROST BRIDGE 345				BERLIN	119	
MIDDLETOWN 3	118/116			FROST BRIDGE 115				N. BLOOMFIELD	157	
MIDDLETOWN 4	360/359			FROST BRIDGE XF				GLENBROOK	191	
MILLSTONE 1	357/357			PL VLY-LNG MT 398				FROST BRIDGE	157	
MILLSTONE 2	357/357			LUDLOW 345				PLUMTREE	80	
MILLSTONE 3	357/357			LUDLOW 115				NORWALK HBR	79	
MASS POWER	117/117			LUDLOW 1X XF				AGAWAM	104	
MONTVILLE 6	117/117			LUDLOW 3X XF				MONTVILLE	105	
MOUNT TOM	115/115			MANCHESTER 345				SOUTHINGTON	157	
NORTHFIELD G1	359/359			MANCHESTER 115				DARIEN	40	
NORTHFIELD G2	359/359			MANCHESTER 4X XF				WATERSIDE	40	
NORTHFIELD G3	359/359			MANCHESTER 5X XF						
NORTHFIELD G4	359/359			MANCHESTER 6X XF						
NORTHFIELD P1	351/351			MONTVILLE 345						
NORTHFIELD P2	351/351			MONTVILLE 115						
NORTHFIELD P3	351/351			MONTVILLE 18X XF						
NORTHFIELD P4	351/351			MONTVILLE 19X XF						
NORWALK HBR 1	119/119			NWK HBR-NPRT 1385						
NORWALK HBR 2	119/119			PLUMTREE 345						
NEW HAVEN HBR	119/117			PLUMTREE 115						
WEST SPFLD 3	116/116			PLUMTREE 1X XF						
ALTRESCO	117/117			PLUMTREE 2X XF						
BRIDGEPORT ENERGY	118/117			SOUTHINGTON 345						
AES THAMES	117/117			SOUTHINGTON 115						
				SOUTHINGTON 1X XF						
				SOUTHINGTON 2X XF						

				SOUTHINGTON 3X XF						
				SOUTHINGTON 4X XF						

Notes: Transformers: (+) denotes flow into low side (-) denotes flow into high side

MAINE / PSNH

UNITS	VOLT SCHED HVY/LGT	VOLT ACTUAL	MVARS	STATIONS/LINES TRANSFORMERS	VOLT SCHED	VOLT ACTUAL	MVARS	CAPACITORS/ REACTORS	AVAIL	MVARS
YARMOUTH 3	120/120							CHESTER SVC CAP	442	
YARMOUTH 4	355/355							CHESTER SVC REAC	-124	
MERRIMACK 1	119/119							ORRINGTON CAP #1	67	
MERRIMACK 2	119/119							ORRINGTON CAP #2	67	
NEWINGTON	357/357							ORRINGTON CAP #3	67	
SCHILLER 4	119/119							ORRINGTN REACT #1	-40	
SCHILLER 5	119/119							ORRINGTN REACT #2	-40	
SCHILLER 6	119/119							MAINE YANKEE	30.6	
SEABROOK	357/357							SUROWIEC REACT #1	-40	
								SUROWIEC REACT #2	-40	
								BEEBE	20	
								MERRIMACK 1	37.5	
								MERRIMACK 2	37.5	
								SCOBIE REACT	-80	

Notes: Transformers: (+) denotes flow into low side (-) denotes flow into high side

DTE Record Request 2

Request:

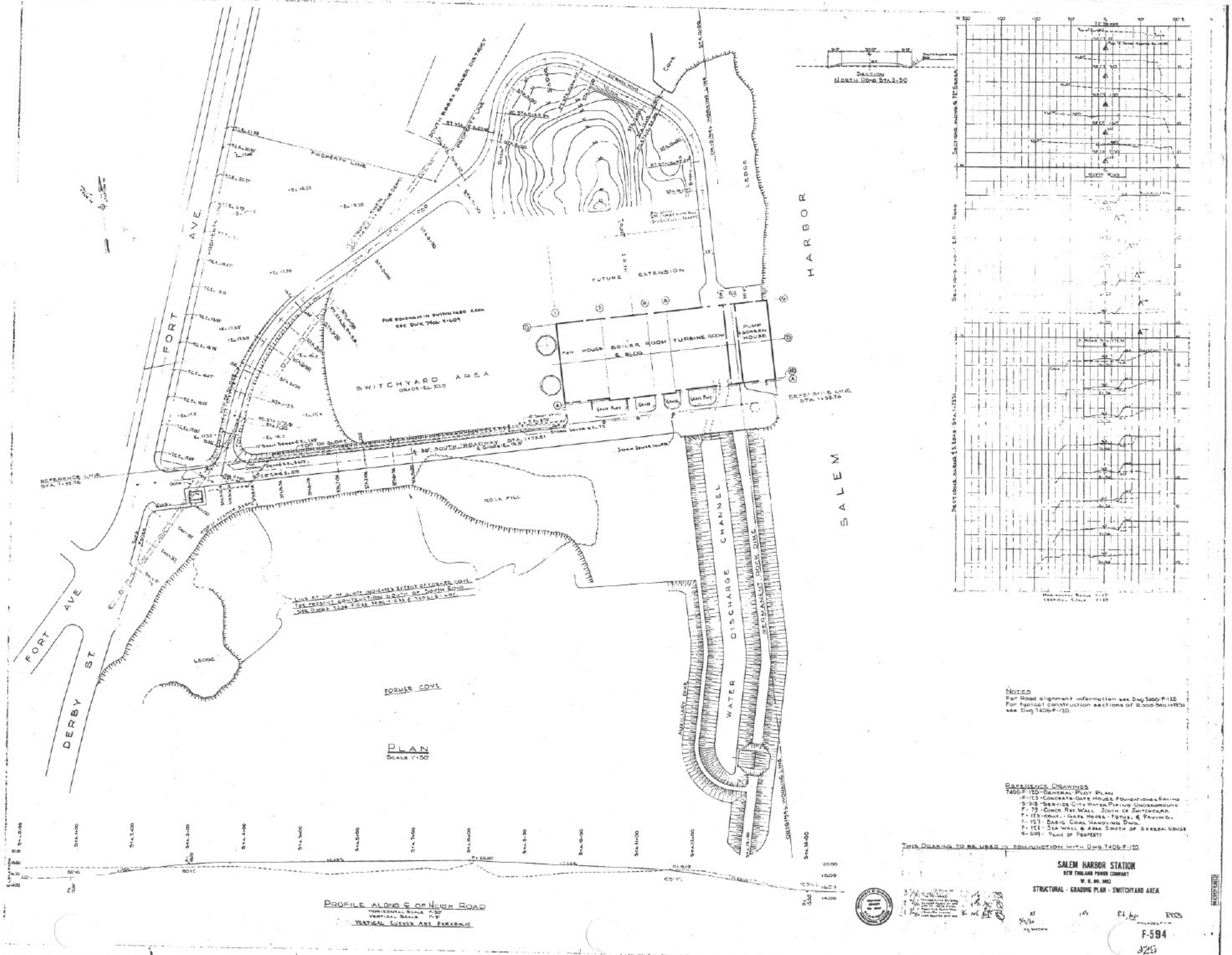
Was the switchyard constructed prior to the enactment of the Salem zoning ordinance?

Response:

According to a telephone conversation with the Clerk's Office of the City of Salem on July 23, 2004, the Zoning Ordinance was first adopted in August of 1965. Engineering drawings in the Company's records indicate that the switchyard was constructed prior to the enactment of the Salem Zoning Ordinance. See Attachment A.

Prepared by or under the supervision of Daniel McIntyre, P.E.

DTE RR-2 ATTACHMENT A



DTE Record Request 3

Request:

Does the company have an estimate of how long it would take to obtain a zoning variance from the board of appeals, for whatever variances are needed? And the second part is, does the company have an estimate of how long a judicial appeal of the special permit could take?

Response:

Inasmuch as the expansion of an existing electric switchyard is not permitted as of right in the City of Salem's zoning district "I" (Industrial), NEP would first be obliged to apply for a special permit under the City's Zoning Ordinance. If that were granted, NEP would also be required to seek a variance from those elements of the ordinance that its project design could not meet due to technical specifications.

As noted in the Department's order relative to USGen New England's petition for a zoning exemption, "the process for obtaining a variance from the Board of Appeals can take up to 114 days from the submittal of the petition for a variance; including appeal periods, the process could take almost seven months." *USGen New England, Inc*., DTE 03-83 at 16 (June 2004). Since a variance can be appealed in the Land Court, Superior Court, Housing Court or District Court, the project would be subject to the uncertainty and delays of the court system, which could result in further delays. *Id*. at 17.

The process of obtaining a special permit from which an appeal could be lodged could take as long as 189 days. A judicial appeal, which could be filed with the Land Court, Superior Court, Housing Court or District Court, would be subject to the uncertainty and delays of the court system and could take years. NEP's proposed project, as well, could be impeded by "the potential delays associated with the Special Permit process." *Id*. at 19.

In the instant case it is important to understand that under the current construction of state law, an appeal of a special permit under a local zoning code can only be lodged once an associated building permit is issued. The project which is the subject of this proceeding does not require a building permit. Accordingly, there is no clear path for appealing a locally-issued special permit. If NEP or another aggrieved party desired to appeal a locally-issued special permit for the capacitor bank project, the appellant would first be required to plead and prevail on due process and procedural issues before proceeding to a hearing in the merits of the local Board's special permit decision.

This entire procedure could require years to move through state courts and would likely be a matter of first impression.

Prepared by or under the supervision of Paige Graening, Esq.

DTE Record Request 4

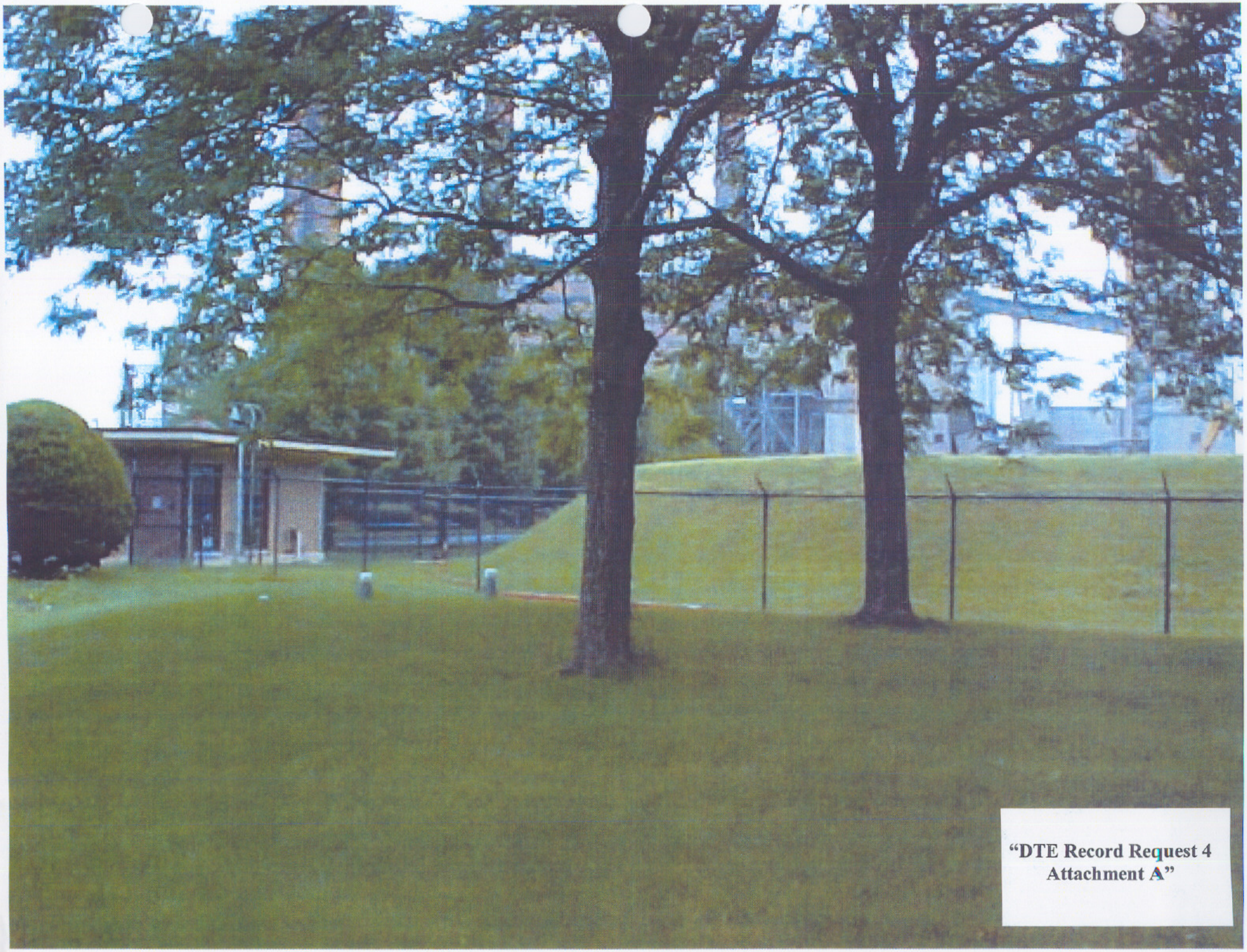
Request:

What is the extent of the stockade fence and the vegetative screening to the south of the main entrance gate along Fort Avenue into Derby Street?

Response:

There is no stockade fence. As shown by the photos attached as DTE Record Request 4, Attachment A & Attachment B, the vegetative screening to the south of the main entrance gate consists primarily of trees.

Prepared by or under the supervision of F. Paul Richards


"DTE Record Request 4
Attachment A"


"DTE Record Request 4
Attachment B"

USGenNE Record Request 1

Request:

Please provide a Q-V curve analysis which reflects the addition of three new transformers (creating a total of four) at Ward Hill along with a list relative to the response in IR Salem 1-2 Attachment A, page 24, indicating the improvements identified in the aforementioned Attachment which are assumed to be completed for purposes of the Q-V curve analysis.

Response:

The Q-V curves are attached for the years 2004 through 2007. The list below indicates which improvements are assumed to be completed for the analysis of the years 2006 and 2007:

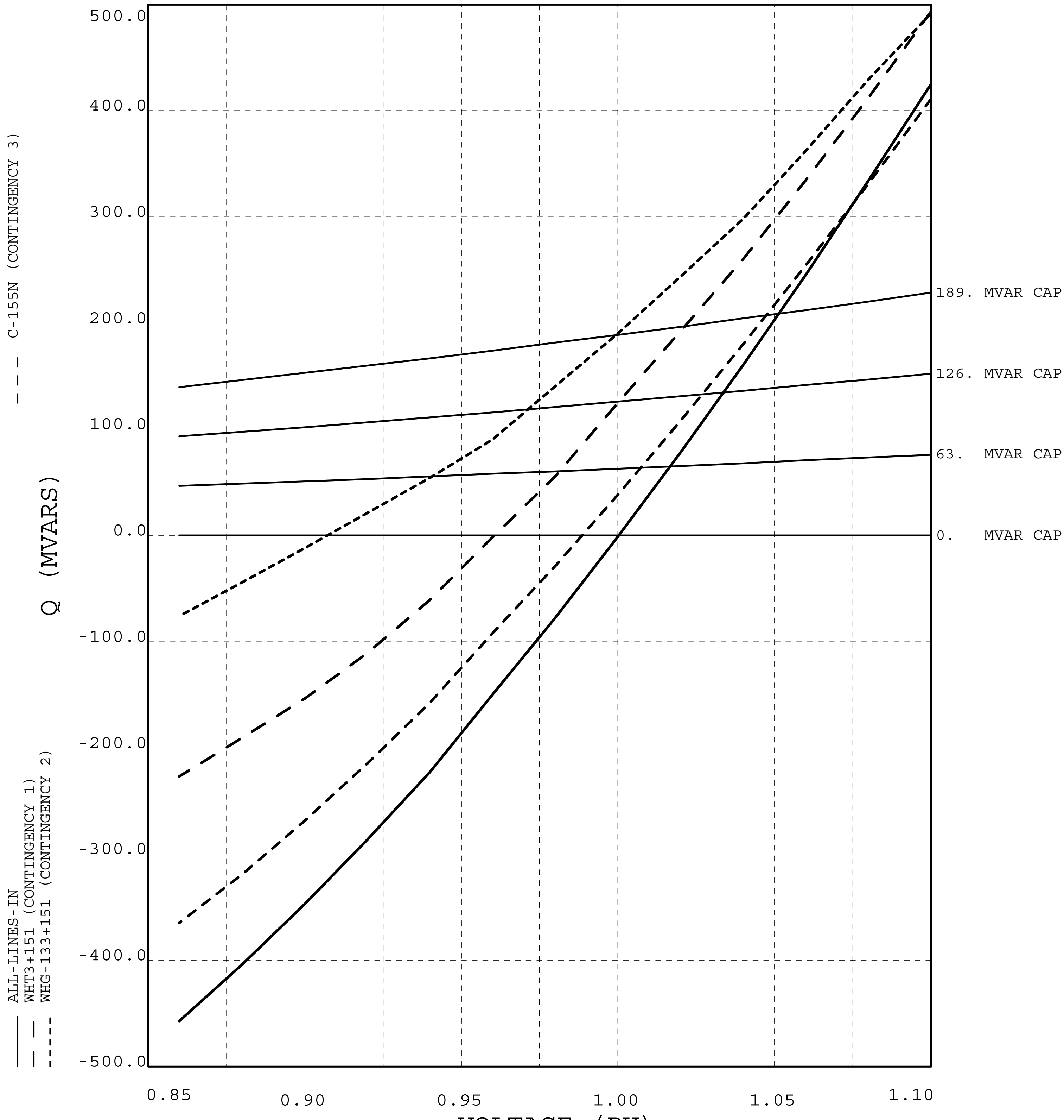
- Reconductor the 115 kV overhead lines B-154N and C-155N from Ward Hill to the King Street tap.
- Reconductor the 115 kV overhead line G-133E 3.16 miles from Ward Hill to the East Methuen substation; replace terminal equipment at East Methuen.
- Expand 345 kV at Ward Hill to a breaker and a half arrangement and split the 394 line (Seabrook to Tewksbury) into two sections from Seabrook to Ward Hill and Ward Hill to Tewksbury, referred to for planning purposes as 394N and 394S respectively.
- Install three additional Ward Hill 345-115 kV transformers (T4, T5, and T6).

Prepared by or under the supervision of John W. Martin, P.E.

Q-V CURVE ANALYSIS

QV Curves at Salem Harbor 115 kV, No Salem Gen, Ward Hill 2004

* DENOTES CASE DID NOT CONVERGE

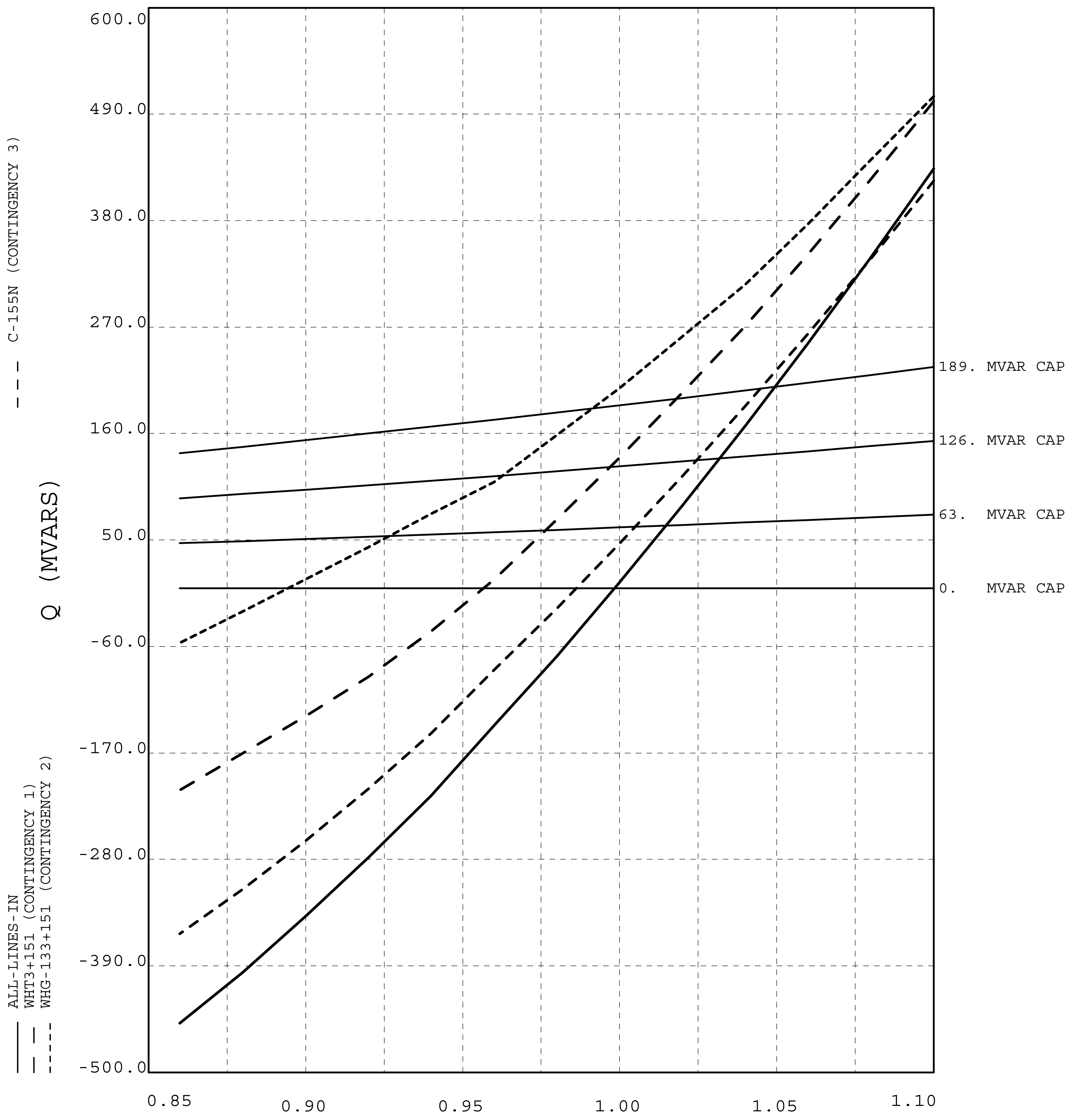


CONTROL BUS = 71891 SALEM HR 115

Q-V CURVE ANALYSIS

QV Curves at Salem Harbor 115 kV, No Salem Gen, Ward Hill 2005

* DENOTES CASE DID NOT CONVERGE

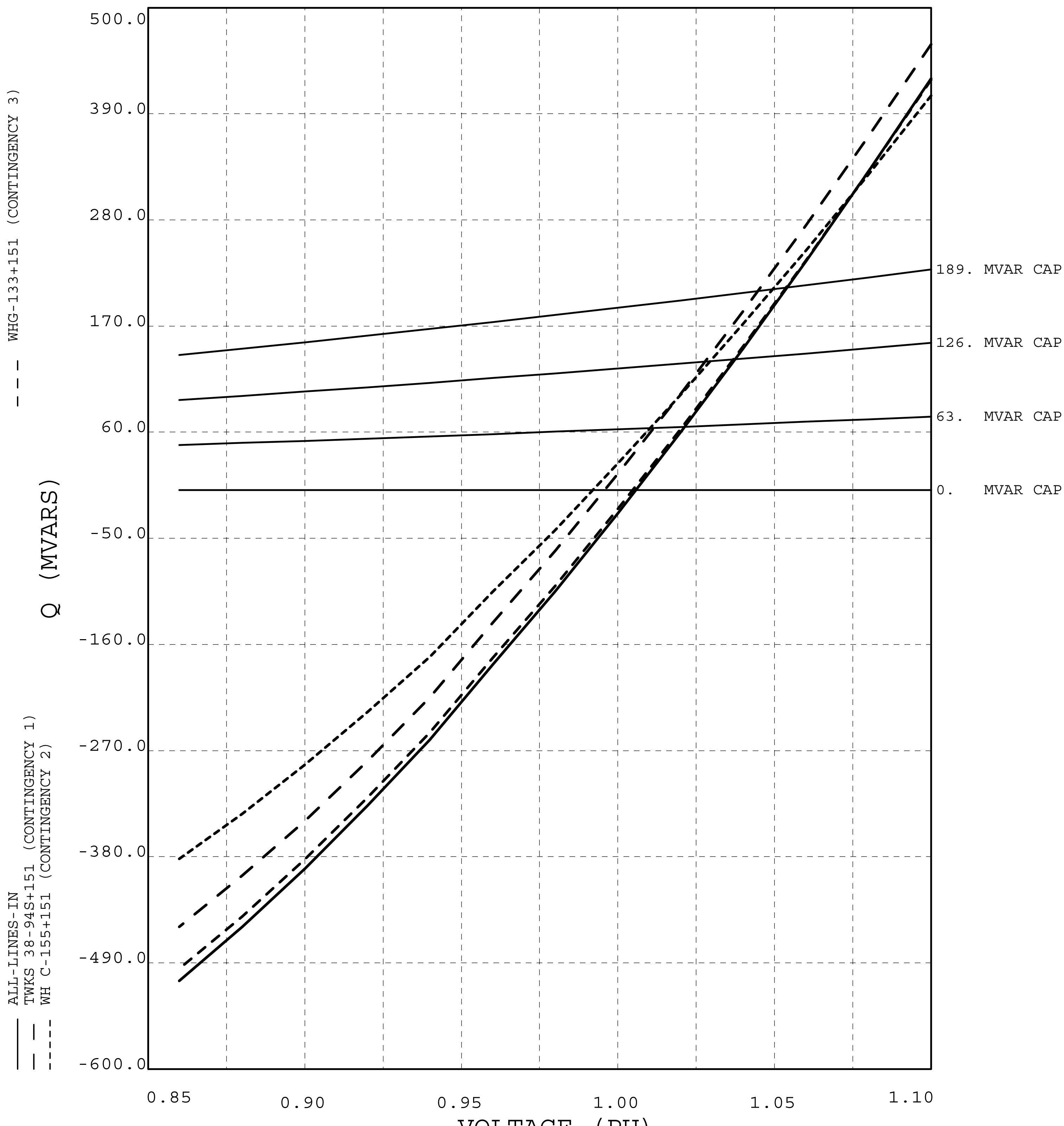


CONTROL BUS = 71891 SALEM HR 115

Q-V CURVE ANALYSIS

QV Curves at Salem Harbor 115 kV, No Salem Gen, Ward Hill 2006

* DENOTES CASE DID NOT CONVERGE

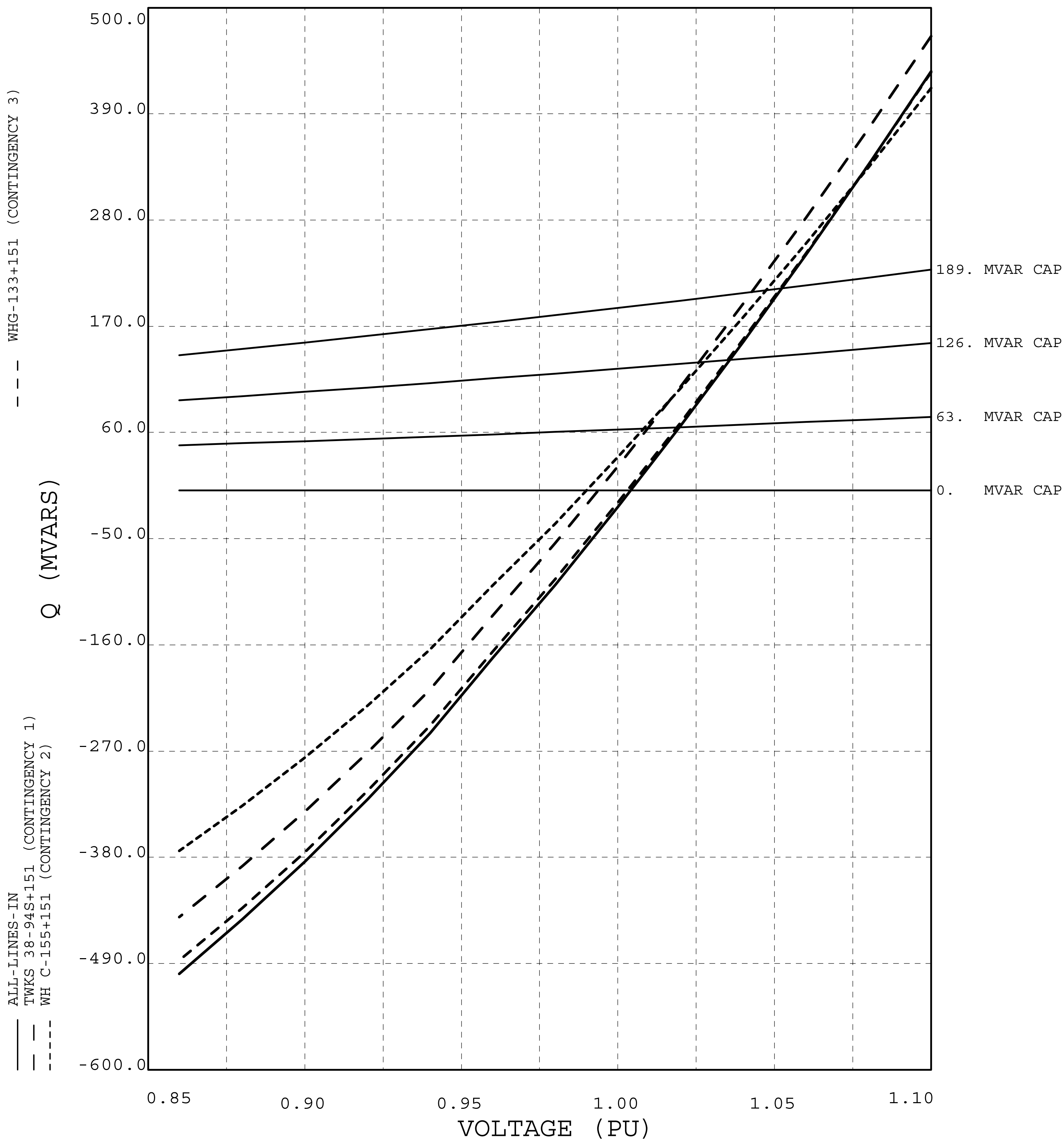


CONTROL BUS = 71891 SALEM HR 115

Q-V CURVE ANALYSIS

QV Curves at Salem Harbor 115 kV, No Salem Gen, Ward Hill 2007

* DENOTES CASE DID NOT CONVERGE



CONTROL BUS = 71891 SALEM HR 115

USGenNE Record Request 2

Request:

Please regenerate the tables shown in the response to DTE 1-8 assuming the implementation of the upgrades referenced in Section 9 of the April 2004 study and assuming the installation of a capacitor bank at King Street as early as is needed to address the voltage-support deficit, if any, identified by the Company at King Street; and that the tables be generated to show the voltage support levels – the voltage levels in 2005 and 2006 and 2007.

Response:

Review of the King Street voltages with the proposed upgrades as outlined in response to USGen RR-1 indicated no additional voltage support needed at King Street in the year 2006 or 2007. The tables in DTE 1-8 have been re-run for 2005 through 2007 with that in mind. (The year 2005 results indicate a potential voltage problem if no Salem Harbor generation is running; however, given that ISO-NE has indicated Salem generation needs to be retained until the NSTAR and National Grid projects are completed, the scenario depicted in the year 2005 table is highly unlikely.)

The tables below provide voltages for the two King Street 115 kV buses (on lines B-154N and C-155N). Salem Harbor 115 kV voltages are provided for reference. "N/A" indicates the bus was outaged by the contingency.

This table corresponds to year 2005 with no upgrades and no capacitor banks at Salem Harbor.

2005	King St 54		King St 55		Salem Harbor	
Scenario	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)
All Lines In	.976	112.2	.967	111.2	.998	114.8
Contingency 1 (WHT3 + 151)	.899	103.4	.887	102.0	.957	110.1
Contingency 2 (WH G-133+151)	.774	89.0	.757	87.1	.895	102.9
Contingency 3 (C-155)	.895	102.9	N/A	N/A	.986	113.4

This table corresponds to year 2006 with the upgrades noted above and no capacitor banks at Salem Harbor.

2006 – no Salem capacitors	King St 54		King St 55		Salem Harbor	
Scenario	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)
All Lines In	.997	114.7	.988	113.6	1.006	115.7
Contingency 1 (Twks 38-94S + 151)	.980	112.7	.970	111.6	.996	114.5
Contingency 2 (WH C-155 + 151)	.925	106.4	N/A	N/A	.993	114.2
Contingency 3 (WH G-133 + 151)	.995	114.4	.986	113.4	1.005	115.6

This table corresponds to year 2006 with the upgrades noted above but with capacitor banks at Salem Harbor.

2006 – with Salem capacitors	King St 54		King St 55		Salem Harbor	
Scenario	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)
All Lines In	1.005	115.6	.996	114.5	1.037	119.3
Contingency 1 (Twks 38-94S + 151)	.990	113.9	.981	112.8	1.028	118.2
Contingency 2 (WH C-155 + 151)	.929	106.8	N/A	N/A	1.029	118.3
Contingency 3 (WH G-133 + 151)	1.005	115.6	.996	114.5	1.037	119.3

This table corresponds to year 2007 with the upgrades noted above and no capacitor banks at Salem Harbor.

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2007 – no Salem capacitors	King St 54		King St 55		Salem Harbor	
Scenario	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)
All Lines In	.994	114.3	.985	113.3	1.004	115.5
Contingency 1 (Twks 38-94S + 151)	.977	112.4	.967	111.2	.994	114.3
Contingency 2 (WH C-155 + 151)	.916	105.3	N/A	N/A	.990	113.9
Contingency 3 (WH G-133 + 151)	.993	114.2	.983	113.0	1.003	115.3

This table corresponds to year 2007 with the upgrades noted above but with capacitor banks at Salem Harbor.

2007 – with Salem capacitors	King St 54		King St 55		Salem Harbor	
Scenario	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)	Voltage (p.u.)	Voltage (kV)
All Lines In	1.003	115.3	.994	114.3	1.036	119.1
Contingency 1 (Twks 38-94S + 151)	.987	113.5	.977	112.4	1.026	118.0
Contingency 2 (WH C-155 + 151)	.925	106.4	N/A	N/A	1.027	118.1
Contingency 3 (WH G-133 + 151)	1.002	115.2	.993	114.2	1.035	119.0

Prepared by or under the supervision of John W. Martin, P.E.

USGenNE Record Request 3

Request:

Please provide a set of Q-V curves which reflect the same assumptions as would be reflected in the rerun of tables for DTE 1-8 under USGenNE Record Request 2 - - specifically a set of Q-V curves that would reflect the planned upgrades and the same set of assumptions about a capacitor bank being installed at King Street.

Response:

Please refer to responses to US Gen 1 and 2. As there were no capacitors added at King Street, the Q-V curves provided in USGen 1 apply to USGen 2 as well.

Prepared by or under the supervision of John W. Martin, P.E.

USGenNE Record Request 4

Request:

Please provide a list of the mitigation measures in the Environmental Impact Statement presented to the Planning Board and referenced in Salem 1-30, Attachment B, Section 8(d), and indicate which measures NEP will agree to implement.

Response:

USGenNE's environmental impact statement did not detail mitigation measures in a list, however NEP has attempted to identify and list all such measures.

1. *Mitigation Measure* - "To the extent feasible, unpaved roadways, parking and laydown areas on the site will be graveled or paved during the early part of the construction schedule [in order to reduce fugitive particulate emissions]." See, § 2.1.4.

   NEP's position relative to Implementation – The work areas will have foundations installed and crushed stone spread as soon as feasible in the construction process. This should the mitigate the minimal amount of fugitive particulate emissions possible from NEP's small project.
2. *Mitigation Measure* - "Fugitive dust will also be reduced using periodic water sprays on the roadways and site service roads." See, § 2.1.4.

   NEP's position relative to Implementation – Access to the NEP work area will be over paved roads: no fugitive dust.
3. *Mitigation Measure* - "Water from construction dewatering activities will be routed to a sedimentation basin then to the on-site wastewater treatment system."

   NEP's position relative to Implementation – NEP believes its shallow foundations will not require dewatering. However in the event dewatering is considered necessary, a discharge sump will be constructed in the pervious substation yard area to filter out sediment and recharge the water back into the soil.

4. *Mitigation Measure* - "Contractors involved with these sites [Massachusetts Contingency Plan sites at Salem Harbor] will be given a Soil and Groundwater Management Plan, and Health and Safety Plan and Release Abatement Measure (RAM) Plans…The contractors will work closely with the on-site USGenNE Environmental Manager, and Licensed Site Professional for proper management of soil and groundwater." See, § 2.2.2.

   NEP's position relative to Implementation – The area where NEP's project is located is outside of the Massachusetts Contingency Plan site. However, NEP will test and properly dispose of all soil leaving the site.

5. *Mitigation Measure* - Work in this buffer zone [the area within 100 feet of the shoreline that consists of riprap and bulkhead] will be performed consistent with an Order of Conditions, which has been requested of the Salem Conservation Commission. See, § 2.3.

   NEP's position relative to Implementation – The area where NEP's project will take place is outside of the buffer zone therefore Conservation Commission jurisdiction is not germane to this project.

6. *Mitigation Measure* - "In order to prevent sand and silt from entering Salem Harbor during construction, sediment retention devices will be installed and maintained along the west bank of the discharge canal, the north bulkhead, and around the catch basins as needed to comply with the Conservation Commission Order of Conditions." See, § 2.3.2.

   NEP's position relative to Implementation – Because of the distance between NEP's project and Salem Harbor, this measure is not applicable to NEP's project therefore, NEP will not implement this measure.

7. *Mitigation Measure* - USGenNE's "[p]roject work triggers the one-acre threshold for filing a NOI with EPA and preparation of a Construction Stormwater Pollution Prevention Plan…" See, § 2.3.3.

NEP's position relative to Implementation – Because NEP's project does not exceed the one-acre threshhold, this measure is not applicable to NEP's project .

8. *Mitigation Measure* - Post construction "[s]tormwater will be collected in a stormwater sewer and drained by gravity or pumped to a stormwater detention basin for settling and solids control." See, § 2.3.4.

   NEP's position relative to Implementation – NEP will not implement this measure. Stormwater associated with NEP's project will infiltrate into the ground through the crushed stone surface in the area of the Capacitor Bank and Bay 5. Given the net reduction in impervious surface, collection and draining will not be applicable to the project.

9. *Mitigation Measure* - "Consistent with the City of Salem's regulation of noise, potentially noisy construction activities will be restricted to daytime hours and to weekdays…In addition…functional mufflers will be maintained on construction equipment as a general good construction practice to reduce noise to the extent practical." See, § 2.5.6.

   NEP's position relative to Implementation – NEP's will comply with the City of Salem's Noise Control ordinance and similarly maintain functional mufflers on construction equipment.

10. *Mitigation Measure* - "The …Project will be both similar in height to the existing facility and constructed of similar materials, so that visual contrast will be minimized…Lighting for the Project will be designed to have a minimal impact on the surrounding community." See, § 3.3.

    NEP's position relative to Implementation – The structures associated with NEP's project will be both similar in height to NEP's existing facility and constructed of similar material. NEP will design its manually-operated, emergency lighting to shine downward onto the switchyard facility. Likewise, NEP will design lighting to have minimal impact on the surrounding community.

11. *Mitigation Measure* - "[C]onstruction traffic management [will be coordinated] with the Salem Police Department. See, § 4.4.2.

    NEP's position relative to Implementation – NEP has agreed to discuss construction traffic management with the Salem Police Department. Please see NEP's response to USGenNE Record Request 5.

12. *Mitigation Measure* – "Deliveries of large equipment and ductwork are planned to be by barge…" See, § 4.4.2.

    NEP's position relative to Implementation – Please see NEP's response to USGenNE Record Request 6.

13. *Mitigation Measure* – "Construction traffic routes for construction workers and trucks will be enforced during the construction phase of the Project." See, § 4.4.2.

    NEP's position relative to Implementation – Please see NEP's response to USGenNE Record Request 5.

Prepared by or under the supervision of F. Paul Richards/Daniel McIntyre, P.E.

USGenNE Record Request 5

Request:

Please provide a list of the traffic management mitigation measures contained in the construction traffic management plan, that USGenNE will provide to NEP, which NEP is willing to implement.

Response:

NEP has reviewed the report entitled "Construction Traffic Management Plan" dated September 30, 2003 prepared for the USGen New England's Salem Harbor Generating Plant Emissions Control Project.

The Emissions Control Project, as described in this report, will require 18 to 24 months to complete after 5 months of site preparation work. The project will require a peak of 150 workers per day for six months of the construction schedule. The average number of deliveries will be 8 to 9 per day with a peak of 50 to 70 deliveries per day for six weeks during the site preparation phase. After completion of the project there will be an increase from 38 trucks per day to 54 trucks per day accessing the facility during its normal 24 hour a day seven day a week operation.

In stark contrast, NEP's Capacitor Bank Project has a 6-month construction schedule with an average daily work force of 8 to 12 workers and total of about 30 material delivery trucks spread over the construction period.

The following are excerpts from the Construction Traffic Management Plan highlighting proposals by USGenNE to mitigate traffic concerns for its Emissions Control Project and NEP's response to each.

"The Project plans to deliver large modules of equipment and ductwork by barge in order to shorten construction schedule and minimize truck deliveries to the site."

The large nodules of equipment referred to by USGenNE consist of 15 foot by 15 foot duct sections that would probably require special hauling trucks and permits to transport over the road. The NEP project does not require any large equipment of this size and therefore this measure is not applicable.

"Other materials such as concrete reinforcing steel, structural steel, electrical equipment conduit, pipe, valves and other material s will be delivered by truck."

With the exception of pipe and valves, this is the type of equipment that will be used in the capacitor bank project and NEP will comply with this measure.

"In order to minimize impacts from construction traffic, trucks and construction workers will be routed along established routes already frequented by trucks and cars traveling to and from the Facility."

NEP also plans to use established routes already frequented by trucks and cars traveling to and from the Facility.

"Construction traffic will utilize the Webb Street gate (where Webb Street meets Derby Street). Cars and trucks for operating personnel and truck deliveries for plant operation will continue to access the Facility at the main gate at Fort Avenue. Trucks arriving outside normal construction hours will be use the Fort Avenue Gate."

Since the construction workers and materials deliveries for NEP's project are much smaller than the Emission Control Project, NEP is planning on using the main gate at Fort Avenue. This is the gate that is currently used by USGenNE's 150 plant employees and the 38 plant delivery trucks per day. However, NEP is willing to work closely with USGenNE to coordinate this work, as it currently does with the ongoing automation project. For example, at USGenNE's request, NEP coordinated some material delivery for the automation project from the main gate on Fort Avenue to a second gate further east on Fort Avenue. NEP does not anticipate trucks arriving outside normal construction hours.

"Construction is planned to take place during the normal work time of 8 AM to 5 PM. The construction workers will generally arrive over approximately a one half hour period prior to the start of the shift. It is also anticipated that, during the peak construction period, police details will be employed as necessary for traffic control during the morning hours, 6:30 AM - 10:30 AM, and afternoon hours, 1:30 PM - 5:30 PM."

NEP also plans to work 8AM to 5 PM with workers generally arriving one-half hour earlier. NEP does not see the need for police details for its small project, particularly from 6:30 AM to 7:30 AM when there should be no construction traffic. NEP recently attempted to discuss its project with the Salem Police Department, but was discouraged from doing so by the City Solicitor.

"Proper signage as required by the Traffic and Police Departments will be provided."

It is unclear what USGenNE means by "proper signage" so NEP is unable to comment on this measure. NEP recently attempted to discuss the meaning of "proper signage" with the Salem Police Department, but was discouraged from doing so by the City Solicitor.

"Roads and sidewalks surrounding the Facility site will be kept free of construction debris, dust and dirt caused by demolition and construction of the project."

NEP intends to keep its operations from depositing dirt on City streets by proper housekeeping of its project site. If NEP construction trucks do track material onto City streets, it will be cleaned up by NEP.

"All construction materials will be stored within the Facility property line/fence."

NEP is willing to implement this condition.

"There will be no off site queuing of trucks."

Since NEP's material delivery trucks are proposed to be few and infrequent, they will go directly to the work area without the need for queuing.

"There will be a phone number for construction related issues/concerns."

NEP is willing to implement this condition.

"The project will include coordination with the Bentley School during the planning and execution phases."

It is unclear what is meant by coordination with the Bentley School. NEP is willing to make all reasonable efforts to coordinate its work with both USGenNE and area abutters.

Prepared by or under the supervision of Daniel McIntyre, P.E.

USGenNE Record Request 6

Request:

Please indicate, after inquiry, the feasibility of moving steel and other large pieces of equipment to the site by barge.

Response:

NEP has reviewed the feasibility of delivery of some materials for the capacitor bank project by barge. Although all of NEP's deliveries can be made using street-legal delivery trucks, unlike the deliveries for USGenNE's Emission Control Project, NEP has evaluated the feasibility of delivering the steel for the switchyard's 5th bay expansion by barge. Since NEP's steel fabricators are located in inland areas, NEP would need to truck the steel to a port area for water delivery to Salem. It is estimated that the steel for the 5th bay extension would be delivered to a port on three flatbed delivery trucks.

Since NEP has a waterfront facility in Beverly adjacent to a marine contractor, it assumed that delivery would be made to this facility for subsequent transport to Salem. A marine contractor was contacted to discuss the idea.

Barge delivery would require close coordination between the steel fabricator's delivery trucks, the marine contractor, the harbormaster and USGenNE. NEP's cost for this coordination effort is difficult to estimate but could be expected to high. Material delivery by barge would require work outside of NEP's easement, requiring negotiation, permission and coordination with USGenNE. Also, barge delivery is more dependent on weather and tides. All of these factors would likely affect the construction schedule and perhaps the work hours on the steel delivery day as well.

Steel delivery over the road to Salem allows the trucks to be staggered so NEP can take delivery of the steel as it is fabricated. Delivery by barge would be most efficient if all the steel were delivered to Beverly at one time in order to make one barge trip into Salem. Since the switchyard is approximately 300 feet from the Salem Harbor wharf, a truck would be required to bring the steel from the barge across USGenNE's property to NEP's switchyard easement. Therefore, an empty flatbed truck would have to drive through Salem to the plant in order to transport the steel from the wharf to the switchyard easement area, 400 feet away. Moving the steel pieces from the barge to the NEP worksite by crane in a congested areas such as an operating power plant is not considered safe or feasible.

Based on this review, NEP believes that barge delivery of material that could be delivered over the road legally and safely, as will be done by USGenNE for similar material, is unfeasible and unreasonable.

Prepared by or under the supervision of Daniel McIntyre, P.E.

USGenNE Record Request 7

Request:

Please review the environmental impact statement submitted by Salem Harbor to the City of Salem planning Board and indicate whether NEP will abide by the environmental impact statement requirements for noise during the operation of the project.

Response:

Yes, NEP will abide by the environmental impact statement requirements for noise during the operation of the project.

Prepared by or under the supervision of F. Paul Richards

USGenNE Record Request 8

Request

Please provide a copy of a switching study, which explores the potential impact on Salem Harbor/SESD from the switching of the proposed capacitor bank.

Response:

See Attachments A and B.

Prepared by or under the supervision of John W. Martin, P.E.